

What is claimed:

- 1                   1.       An exercise reel comprising:  
2                   an elongated tension member having first and second ends;  
3                   a user engagement connected to the elongated tension member first end  
4                   for engaging a body appendage;  
5                   a spool connected to the elongated tension member second end and on  
6                   which the elongated tension member is adapted to be wound;  
7                   a resistance mechanism for resisting unwinding of the spool, the  
8                   resistance mechanism comprising a rotatable disk and a pair of calipers for engaging the  
9                   rotatable disk; and  
10                  a retraction mechanism for automatically rewinding the spool.
- 1                   2.       The exercise reel of claim 1, wherein the retraction mechanism  
2                   further comprises a spring.
- 1                   3.       The exercise reel of claim 2, wherein the spring comprises a coil  
2                   spring.
- 1                   4.       The exercise reel of claim 1, wherein the resistance mechanism is  
2                   adjustable.
- 1                   5.       The exercise reel of claim 1 further comprising a mounting  
2                   connection for mounting the reel to a surface.
- 1                   6.       The exercise reel of claim 1 wherein the user engagement  
2                   comprises a loop.
- 1                   7.       The exercise reel of claim 1 wherein the loop is padded.
- 1                   8.       The exercise reel of claim 7 wherein the loop is adjustable.

1                   9.     The exercise reel of claim 8 wherein the loop is adjustable by use  
2 of an adjustment mechanism selected from the group consisting of: a buckle, a set of  
3 snaps or buttons, a set of micro-hooks and micro-loops, and a cable-through-ring  
4 mechanism.

1                   10.    The exercise reel of claim 1 wherein the resistance mechanism  
2 provides a resistance of not greater than about 5 pounds of force.

1                   11.    The exercise reel of claim 1 wherein the resistance mechanism  
2 provides an adjustable resistance that is adjustable to provide a resistance of greater than  
3 about 5 pounds of force.

1                   12.    An exercise machine comprising at least one exercise reel of claim  
2 1.

1                   13.    The exercise machine of claim 12 comprising an aerobic lower  
2 body exercise machine wherein the exercise reel comprises an exercise reel adapted to  
3 exercise a user's upper body to provide a total body workout.

1                   14.    The exercise machine of claim 13 wherein the exercise reel  
2 comprises a forward-stroke arm exercise reel positioned behind a user to provide  
3 resistance to a forward swinging motion of an arm of the user while allowing the user's  
4 arm to perform the forward swinging motion in a natural, free-swinging arm position.

1                   15.    The exercise machine of claim 14 further comprising a backward-  
2 stroke arm exercise reel adapted for use by the same arm of the user as the forward-  
3 stroke arm exercise reel, the backward-stroke arm exercise reel positioned in front of the  
4 user to provide resistance to a backward swinging motion of the user's arm while  
5 allowing the user's arm to perform the backward swinging motion in the naturally  
6 extended arm position.

1                   16.    The exercise machine of claim 14 wherein the user engagement is  
2 adapted to engage the user's hand, arm, or wrist.

1           17.     The exercise machine of claim 14 comprising at least two arm  
2 exercise reels, a first reel adapted for use by a left arm of the user and a second reel  
3 adapted for use by a right arm of the user.

1           18.     The exercise machine of claim 14 comprising only a single arm  
2 exercise reel adapted to be used either by the left arm or right arm of the user.

1           19.     The exercise machine of claim 13 wherein the aerobic lower body  
2 exercise machine comprises a machine selected from a group consisting of: treadmills,  
3 air walkers/gliders, upright and recumbent bicycle machines, torso-twisting disks, cross-  
4 trainers, steppers, elliptical exercise machines, cross-country and downhill ski machines,  
5 trampolines, squat machines, rowing machines, stretching machines, and abdominal  
6 machines.

1           20.     The exercise machine of claim 14 further comprising a support  
2 structure mounted behind the user for preventing the user from being pulled backward  
3 off of the machine by the resistance of the arm exercise reel.

1           21.     The exercise machine of claim 20 wherein the support structure  
2 comprises a padded support adapted to engage the back or buttocks of the user.

1           22.     The exercise machine of claim 21 wherein the support structure is  
2 adjustable in at least one direction in the group consisting of: up and down, forward and  
3 back, and left and right.

1           23.     The exercise machine of claim 13 wherein the elongated tension  
2 member consists of a length sufficient to extend from a mounting point of the reel on the  
3 machine to a furthest point of a user's arm swing from the mounting point, and the spool  
4 is sized to hold substantially all of the elongated tension member length.

1           24.     An exercise machine comprising an aerobic lower body exercise  
2 machine comprising a single exercise reel mounted behind the user for exercising a  
3 user's upper body, the single exercise reel comprising a resistance mechanism for  
4 resisting unwinding of the spool and a retraction mechanism for rewinding the spool, a  
5 first elongated tension member adapted for use by a left arm of the user and having a  
6 user engagement connected thereto, a second elongated tension member adapted for use

7 by a right arm of the user and having a user engagement connected thereto, each  
8 elongated tension member having a portion engaged by the reel to provide resistance to  
9 the forward swinging motion of each arm.

1 25. The machine of claim 24 wherein the first elongated tension  
2 member and the second elongated tension member comprise portions of a single  
3 elongated tension member and the portion engaged by the reel comprises a middle  
4 portion of the single elongated tension member.

1 26. The exercise machine of claim 24 wherein the resistance  
2 mechanism comprises a knob screw having a shaft coaxial with the spool and a spring  
3 coaxial with the knob screw shaft and having opposite ends, one end abutting the knob of  
4 the knob screw and the other end abutting the spool such that as the knob is tightened,  
5 the spring compresses and exerts increased force upon the spool.

1 27. A free-standing exercise device comprising at least one exercise  
2 reel of claim 1.

1 28. The exercise device of claim 27, wherein the user engagement is a  
2 crossbar for engagement by both hands of the user.

1 29. An exercise device comprising a platform and at least one exercise  
2 reel comprising an elongated tensioned member connected between the platform and a  
3 user engagement such that the user may lie or stand upon the platform and perform an  
4 upper body exercise against the resistance of the reel.

1 30. The exercise reel of claim 1 further comprising a clutch  
2 mechanism to disengage the resistance mechanism during rewinding of the spool.

1 31. The exercise reel of claim 30 wherein the clutch is a roller clutch.

1 32. The exercise reel of claim 1 further comprising a housing for  
2 enclosing the spool, the rewind mechanism, and resistance mechanism.

1 33. A method of exercising comprising using the exercise device of  
2 claim 1.

1 34. A method of exercising comprising using the exercise device of  
2 claim 12.

1 35. A method of exercising comprising using the exercise device of  
2 claim 27.

1 36. An exercise machine for exercising a user, the machine comprising  
2 an upper body exercise component comprising one or more resistance devices adapted to  
3 provide resistance to a forward swinging motion of an arm of the user while allowing the  
4 user's arm to perform the forward swinging motion in a natural, free-swinging arm  
5 position, the resistance device comprising an elongated tension member having first and  
6 second ends, and a user engagement connected to the elongated tension member first  
7 end, wherein the user engagement is padded, adjustable, or a combination thereof.

1 37. The exercise machine of claim 36 wherein the resistance device  
2 comprises a spool connected to the elongated tension member second end and on which  
3 the elongated tension member is adapted to be wound, a resistance mechanism for  
4 resisting unwinding of the spool, and a retraction mechanism for automatically  
5 rewinding the spool.

1 38. The exercise machine of claim 37 wherein the resistance  
2 mechanism comprises a rotatable disk, and first and second calipers adapted to  
3 frictionally engage the rotatable disk.

1 39. The exercise machine of claim 36 wherein the resistance  
2 mechanism is mounted behind the user.

1 40. The exercise machine of claim 36 further comprising at least one  
2 user engagement rest positioned in front of the user for holding the user engagement  
3 when not in use by the user.

1 41. The exercise machine of claim 36, wherein the resistance device is  
2 not located behind the user, the machine further comprising at least one guide mounted  
3 behind the user for directing the elongated tension member to the user from the  
4 resistance device, optionally in cooperation with one or more other guides.

1                   42.     The exercise machine of claim 41, wherein the guide comprises a  
2 roller or pulley.

1                   43.     The exercise machine of claim 41, wherein the resistance device  
2 comprises a spring having a first end connected to the exercise machine and a second end  
3 connected to the elongated tension member second end.

1                   44.     The exercise machine of claim 41, wherein the resistance device  
2 comprises a single reel comprising at least one elongated tension member having a  
3 portion engaged by the reel, a first user engagement adapted for use by a left arm of the  
4 user, and a second user engagement adapted for use by a right arm of the user.

1                   45.     The exercise machine of claim 44 wherein the resistance device  
2 comprises a resistance mechanism comprising a knob screw having a shaft coaxial with  
3 the spool and a spring coaxial with the knob screw shaft and having opposite ends, one  
4 end abutting the knob of the knob screw and the other end abutting the spool such that as  
5 the knob is tightened, the spring compresses and exerts increased force upon the spool.

1                   46.     The exercise machine of claim 36 wherein the resistance  
2 mechanism comprises an elastic member having adjustable resistance.

1                   47.     The exercise machine of claim 46, wherein the elastic member  
2 comprises a portion having an adjustable length subject to tension, the adjustable  
3 resistance effected by adjusting the length of the portion subject to tension.

1                   48.     The exercise machine of claim 46, wherein the elastic member  
2 comprises a plurality of elastic component members, the adjustable resistance effected by  
3 how many elastic component members are subject to tension.

1                   49.     The exercise machine of claim 36, wherein the exercise machine  
2 comprises an aerobic lower-body exercise machine selected from a group consisting of:  
3 treadmills, air walkers/glidiers, upright and recumbent bicycle machines, torso-twisting  
4 disks, cross-trainers, steppers, elliptical exercise machines, cross-country and downhill  
5 ski machines, trampolines, squat machines, rowing machines, stretching machines, and  
6 abdominal machines.

1           50.     The exercise machine of claim 36, wherein the exercise machine  
2 comprises a lower-body exercise machine having a limited foot support for engaging the  
3 exercise machine, in which the foot support comprises a support area having a length and  
4 a width greater than a length or width of a standard human foot, a raised peripheral edge,  
5 and optionally, a high-traction surface.

1           51.     The exercise machine of claim 50 further comprising a support  
2 structure mounted behind the user for preventing the user from being pulled backward  
3 off of the machine by the resistance supplied by the one or more resistance devices.

1           52.     The exercise machine of claim 36 further comprising a support  
2 structure mounted behind the user for preventing the user from being pulled backward  
3 off of the machine by the resistance supplied by the one or more resistance devices.

1           53.     The exercise machine of claim 36, wherein the exercise machine  
2 comprises a lower-body exercise component having a motion and the one or more  
3 resistance devices are independent of the motion of the lower-body component.

1           54.     The exercise machine of claim 36, wherein the exercise machine  
2 comprises a lower-body exercise component having a motion and the one or more  
3 resistance devices are attached to the lower-body component and dependent upon the  
4 motion of the lower-body component

1           55.     The exercise machine of claim 36, wherein the user engagement is  
2 adapted for being engaged with an open or loose grip.

1           56.     A method of exercising comprising using the machine of claim 36.

1           57.     A method of exercising comprising a user engaging in total body  
2 exercise, including engaging in upper body exercise by swinging the user's arms in a  
3 natural, multi-planar, free-swinging motion against a tensile resistance force directed  
4 from a point behind the user and transmitted by an elongated tension member having a  
5 user engagement adapted to be engaged by the user in a manner other than in a closed  
6 grip.

1                   58.     The method of claim 57 wherein the engagement is by the user's  
2     hand in an open, loose grip.

1                   59.     The method of claim 57, wherein the user engagement is  
2     adjustable, padded, or both.

1                   60.     The method of claim 57, wherein the user engagement is a hand  
2     loop.

1                   61.     The method of claim 57, wherein the resistance force is created by  
2     an exercise reel comprising a spool connected to one end of the elongated tension  
3     member and on which the elongated tension member is adapted to be wound; a  
4     resistance mechanism for resisting unwinding of the spool, and a retraction mechanism  
5     for automatically rewinding the spool.

1                   62.     The exercise reel of claim 4, wherein the adjustable resistance  
2     mechanism comprises an adjustment mechanism that is remotely actuatable.

1                   63.     The exercise machine of claim 12, wherein the exercise reel  
2     comprises a remotely-actuatable adjustable resistance mechanism.

1                   64.     The exercise machine of claim 63, wherein the remotely-actuatable  
2     adjustable resistance mechanism comprises a remote actuator mounted on the machine.

1                   65.     The exercise machine of claim 63, wherein the remotely-actuatable  
2     adjustable resistance mechanism comprises a remote actuator mounted on the user  
3     engagement.

1                   66.     An exercise machine comprising a lower body workout component  
2     and an upper body workout component, the upper body workout component comprising  
3     at least one pole providing resistance to movement thereof, the pole having freedom to  
4     move in multiple planes.

1                   67.     The exercise machine of claim 66, wherein the pole comprises a  
2     ball and socket interface with the machine.



1                   68.     The exercise machine of claim 66, wherein the pole is axially  
2 attached to a helical spring that is connected to the machine.

1                   69.     The exercise machine of claim 66, wherein the resistance is  
2 adjustable.

1                   70.     The exercise machine of claim 69, wherein the pole comprises a  
2 ball and socket interface with the machine and the ball and socket interface comprises a  
3 member for increasing and decreasing radial pressure on the ball.

1                   71.     An aerobic lower body exercise machine comprising an exercise  
2 reel mounted behind the user and adapted to provide a total body workout by exercising a  
3 user's upper body by providing resistance to a natural, free-swinging forward motion of  
4 the user's arm, , the reel comprising:

5                   an elongated tension member having first and second ends and having a  
6 length sufficient to extend from a mounting point of the reel on the machine to a furthest  
7 point of a user's natural arm swing from the mounting point;

8                   a padded, adjustable loop connected to the elongated tension member first  
9 end for engaging the user's hand, arm, or wrist;

10                  a spool connected to the elongated tension member second end and on  
11 which the elongated tension member is adapted to be wound, sized to hold substantially  
12 all of the elongated tension member length;

13                  an adjustable resistance mechanism for resisting unwinding of the spool,  
14 the resistance mechanism comprising a rotatable disk and a pair of calipers for engaging  
15 the rotatable disk;

16                  a roller clutch for disengaging the resistance mechanism during rewinding  
17 of the spool

18                  a coil spring retraction mechanism for automatically rewinding the spool.

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72. A non-treadmill lower body exercise machine comprising at least one device mounted behind a user of the machine for enabling and providing resistance to a multi-planar, natural, free-swinging forward arm motion of the user.

73. A lower body exercise machine comprising at least one device permanently integrated with the machine and mounted behind a user of the machine for enabling and providing resistance to a multi-planar, natural, free-swinging forward arm motion of a user.

74. A lower body exercise machine that is not a cross-country ski machine, comprising at least one device mounted on the machine for enabling and providing resistance to a multi-planar, natural, free-swinging backward arm motion of the user.

75. A method of exercising comprising using the machine of claim 72.

76. A method of exercising comprising using the machine of claim 73.

77. A method of exercising comprising using the machine of claim 74.

78. The method of claim 33 comprising performing warm-up exercises, aerobic and/or strength training exercises, or cool-down exercises.

79. The method of claim 34 comprising performing warm-up exercises, aerobic and/or strength training exercises, or cool-down exercises.

80. The method of claim 35 comprising performing warm-up exercises, aerobic and/or strength training exercises, or cool-down exercises.

81. The method of claim 56 comprising performing warm-up exercises, aerobic and/or strength training exercises, or cool-down exercises.

82. The method of claim 57 comprising performing warm-up exercises, aerobic and/or strength training exercises, or cool-down exercises.

83. The method of claim 75 comprising performing warm-up exercises, aerobic and/or strength training exercises, or cool-down exercises.

